CLAIMS

1. Method for exiting a two-clutch fixed-ratio mode in an electrically variable transmission including an input member and an output member, first and second clutches and first and second modes, said first mode characterized by simultaneous first clutch application and second clutch release, said second mode characterized by simultaneous first clutch release and second clutch application, said two-clutch fixed-ratio mode characterized by simultaneous first and second clutch applications wherein the transmission input member is mechanically coupled to the transmission output member through a predetermined fixed ratio, comprising:

providing a predetermined desired input member speed;

determining actual input member speed;

incrementing a shift confidence factor as a function of a) the difference between the desired input member speed and the actual input member speed and b) the difference between the rate of change of the desired input member speed and the rate of change of the actual input member speed; and,

commanding the release of one of said first and second clutches when said shift confidence factor attains a predetermined threshold.

2. The method for exiting a two-clutch tie up mode as claimed in claim 1 further comprising:

limiting the incrementing of the shift confidence factor as a function of output member acceleration.

3. The method for exiting a two-clutch tie up mode as claimed in claim 1 wherein determining actual input member speed comprises:

measuring output member speed and multiplying said output member speed by said fixed ratio.

4. The method for exiting a two-clutch tie up mode as claimed in claim 1 wherein the incrementing function is a non-linear function of the difference between the desired input member speed and the actual input member speed and the difference between the rate of change of the desired input member speed and the rate of change of the actual input member speed.

5. The method for exiting a two-clutch tie up mode as claimed in claim 1 wherein said shift confidence factor is utilized in commanding the release of the first clutch to effectuate a shift into the second mode.

6. The method for exiting a two-clutch tie up mode as claimed in claim 1 wherein said shift confidence factor is utilized in commanding the release of the second clutch to effectuate a shift into the first mode.

7. The method for exiting a two-clutch tie up mode as claimed in claim 6 further comprising:

incrementing the confidence factor sufficiently to cause commanding the release of the second clutch to effectuate a shift into the first mode when the input member speed is a) less than the desired input member speed and b) less than a predetermined minimum threshold speed.

8. Method for controlling an electrically variable transmission including an input member and an output member, first and second clutches, and first, second and fixed-ratio modes, said first mode characterized by simultaneous first clutch application and second clutch release, said second mode characterized by simultaneous first clutch release and second clutch application, said fixed-ratio mode characterized by simultaneous first and second clutch applications wherein the transmission input member is mechanically coupled to the transmission output member through a predetermined fixed ratio, comprising:

providing a predetermined desired input member speed;

determining actual input member speed; and,

establishing first and second clutch states in accordance with a predetermined relationship among proportional and derivative error quantities determined from said desired input member speed and said actual input member speed.

9. Method for controlling first and second clutches to respective applied or released states as claimed in claim 8 wherein said predetermined relationship is contained in a look-up table of values dependent upon said proportional and derivative error quantities.

10. Method for controlling first and second clutches to respective applied or released states as claimed in claim 8 wherein said predetermined relationship is further among a derivative of output member speed.

11. Method for controlling first and second clutches to respective applied or released states as claimed in claim 8 further comprising:

when the input member speed is a) less than the desired input member speed and b) less than a predetermined minimum threshold speed, overriding establishing the first clutch state in accordance with a predetermined relationship and establishing the first clutch in a released state.

12. Method for scheduling shifts from a fixed-ratio mode to first and second modes in an electrically variable transmission including an input member and an output member, first and second clutches, said first mode characterized by simultaneous first clutch application and second clutch release, said second mode characterized by simultaneous first clutch release and second clutch application, said fixed-ratio mode characterized by simultaneous first and second clutch applications wherein the transmission input member is mechanically coupled to the transmission output member through a predetermined fixed ratio, comprising:

calculating a first signal as the difference between a desired input member speed and an actual input member speed;

calculating a second signal as the time rate of change of the first signal;

calculating a third signal as the time rate of change of an output member speed; and,

scheduling shifts in accordance with shift confidence factors determined as functions of the first, second and third signals.

13. Method for scheduling shifts as claimed in claim 12 wherein scheduling shifts into the first mode is in accordance with a first shift confidence factor and scheduling shifts into the second mode is in accordance with a second shift confidence factor.

14. Method for scheduling shifts as claimed in claim 13 wherein the first shift confidence factor generally trends larger when the first and second signals are positive and generally trends smaller when the first and second signals are negative, and the second shift confidence factor generally trends smaller when the first and second signals are positive and generally trends larger when the first and second signals are negative.

15. Method for scheduling shifts as claimed in claim 14 wherein the trending of the first and second shift confidence factors is attenuated as a function of the third signal.

16. Method for scheduling shifts as claimed in claim 14 wherein the trending of the first shift confidence factor only is attenuated when the third signal is positive and the second shift confidence factor only is attenuated when the third signal is negative.

17. Method for scheduling shifts as claimed in claim 12 further comprising:

scheduling a shift to the first mode when the actual input member speed falls below a predetermined minimum threshold speed and falls below the desired input speed by a predetermined amount.